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SUPPORT THE FIRMS WHO SUPPORT YOUR SOCIETY'S JOURNAL

STONES

C. EDWARDS

Department of Chemical Pathology,
The Medical School, University of Cape Town

Owing to the ever increasing demands made upon Chemical Pathology, we find ourselves requested to carry out more intricate and exacting estimations. This makes it imperative that we do not lack or neglect our studies in basic chemistry.

In the examination of stones (urinary calculi and gall stones), the scope for furthering and enhancing this knowledge cannot be over emphasised; the interesting and adventurous exploration of the varied and numerous chemical components that go to make up such accretions provide us with an opportunity of chasing after those elusive formulae again.

Whenever opportunity permits delve into the composition of these stones and see if you can spot any of the following:

Urinary calculi

Uric acid, Urates.
Triple Phosphates (ammonium magnesium phosphates) $NH_4\,MgPO_4$.
Calcium Hydrogen Phosphate $CaHPO_4$.
Calcium Oxalates CaC_2O_4
Calcium Carbonates $CaCO_3$
Cystine (an amino acid—and protein constituent).
Xanthine (cleavage product of nucleic acid).
Fibrin or protein,
Urostealith (soft, contains large amount of fat)

Gall stones

Cholesterol, bile pigments, calcium, bilurabinate, protein, phosphates and compounds of metals such as iron or copper.

Gouty tophi

Sodium biurate

Pseudo calculi or Foreign bodies

Faecal concretions—Enteroliths (hard rounded masses of food or lumps of faecal matter encrusted with organic salts)

Mostly stones are a mixed bag, a few ashes of the stones and components being rare.

As an introduction to the subject, I shall discuss the detection of calcium in calculi. A simple quantitative method is described in "Harrison's" Chemical Methods in Clinical Medicine (Page 83, 3rd Edition).

Dissolve a small amount of the powdered stone (about 50 mgs.) in approximately 5 ml. of 10% w/v hydrochloric acid, heat and filter (phosphates and oxalates dissolve), make alkaline with ammonia. (phosphates and oxalates will precipitate, and acidify with acetic acid (phosphates dissolve—oxalates remain in the precipiattion).

At this stage should oxalates be absent, add a few drops of saturated ammonium oxalates—a heavy precipitate of calcium oxalates appears if calcium is present. This test will be difficult to assess if oxalates are present in the stone.

Quantitative Method

Weigh out 100 mgs. of the powdered stone, dissolve in sulphuric acid, warm and titrate with N/10 permanganates.

Volume of N/10 permanganate x 2 = mg. of calcium in 100 mgs. of stone.

Another method which can be tried out makes use of E.D.T.A. (di sodium ethylenediamine tetra acetic acid).

Weigh out 100 mg. of the powdered stone, and dissolve in 5 ml. of a normal solution of hydrochloric acid by heating in a 6″ x 1″ boiling tube, add 5 ml. of 10% w/v sodium hydroxide solution, make up to 16 ml. with water add a small quantity of ammonium purpurate powder (about 50 mg. of a mixture of 0.2 g. ammonium purpurate and 100 g. sodium chloride). Shake and carefully pipette out 8 ml. into another 6″ x 1″ tube (control). At this stage if calcium is present a pink colour is formed. Purple if absent.

Into control tube add excess E.D.T.A. (2.976%) note if any further colour change takes place—using this tube as colour control, carefully titrate the second tube with the E.D.T.A. solution until colours match.

Volume of E.D.T.A. x 3.2 = mg. Calcium in 50 mg. of stone
or by 6.4 = mg. Calcium in 100 mg. of stone

This procedure can be used as a rough qualitative method, dissolving about 50 mg. of powdered stone in 10% V/v HCl. Heat add excess of 10% NaOH, w/v, about 50 mg. of ammonium purpurate, add E.D.T.A. and note colour change from pink to deep purple—no change if calcium absent.

Conversion factors Calcium to $CaHPO_4$ x 136/40 or x 3.4
Calcium to Ca oxalate x 128/40 or x 3.2
Calcium to $CaCo_3$ x 100/40 or x 2.5
$CaHPO_4$ to P x 31/136 or to PO_4 x 951/36.

Conclusion

If by chance your interest has been aroused more especially amongst the junior section, it may be that, in future journals, members will contribute a method or methods for one or more of these probable chemical constituents found in stones (not all are mentioned in this article).

The collection and compilation of the articles should form a useful and comprehensive little booklet for Junior Medical Technicians on this subject.

Acknowledgement:

I should like to thank Professor J. E. Kench for his interest.

CURRENT AFFAIRS

SUPPLEMENTARY HEALTH SERVICES

For some years a proposal for control of the auxiliary medical professions by means of a "Supplementary Health Services Bill" has been leading a rather nebulous existence in South Africa. It is interesting, therefore, to note and to comment upon the "Professions Supplementary to Medicine Bill" which was published, in England, on November 19th, 1959.

The Bill provides for a Council for Professions Supplementary to Medicine which will have 23 members. Membership will consist of four appointed by the Privy Council (one of them resident in Scotland and one in Wales) and one appointed by the Governor of Northern Ireland, and of whom none shall be a registered medical practitioner or a member of any of the professions covered by the Bill; four (two of them medical practitioners) appointed by Ministers; eight representing the individual boards; three representing the Royal College of Physicians of London, the Royal College of Surgeons of England and the Royal College of Obstetricians and Gynaecologists; two appointed jointly by the Royal College of Physicians of Edinburgh, the Royal College of Surgeons of Edinburgh and the Royal Faculty of Physicians and Surgeons of Glasgow; and one appointed by the General Medical Council. The numbers on each professional board will be: chiropodists 11; dietitians 15; medical laboratory technologists (technicians) 13; occupational therapists 17; physiotherapists 17; radiographers 13; remedial gymnasts 11; and speech therapists 13. *On each board the representatives of the registered profession will be in a majority of one.* The remaining members will include medical practitioners and experts in professional education.

Decisions of both boards and council which affect training courses and qualifications will need the approval of the Privy Council as will a number of other decisions.

Only registered persons would be entitled to use the relevant title such as "State Registered Medical Laboratory Technician", and the Bill proposes penalties for improper use of the title of a fine, not exceeding £50, on summary conviction, and not exceeding £100 for a second or subsequent conviction.

A person's name may be removed from the register by a disciplinary committee for "infamous conduct in any professional respect", and for obtaining registration by fraudulent means. Names will be struck off the register for crimes or professional misconduct after a hearing by an investigating committee and a hearing by the disciplinary committee. There is right of appeal to the Judicial Committee of the Privy Council.

The ink was hardly dry before the outcry reached the lay and medical press and the crux of the argument appears to be the one sentence which I have emphasized by italics above.

The London Times in a leading article on November 30th, 1959, says: " . . . the public will be able to recognise the fully qualified specialist, distinguished by the title 'state registered', from the charlatan. But why has statutory registration been delayed so long? At least part of the answer is that it has been, and continues to be, the subject of considerable wrangling. The last issue of the British Medical Journal reiterates the main medical criticism by complaining that there will not be a majority of doctors on the registering body. But there will be some compensation in the composition of the Council."

In a letter to the *Times*, published on December 3rd, 1959, the Chairman of the Consulting Pathologists' Group Committee, British Medical Association, comments: "If the Bill becomes law in its present form the medical profession would, therefore, continue to be responsible at law for the work of the auxiliaries, but would be debarred from *supervising* (present writer's italics) either their training or the standards acceptable for their registration."

This point will, I feel sure, prove to be a stumbling block here in South Africa. Let us consider this word "supervising". It is defined as "exercising supervision". Is this the best thing? Would not "advising on" or "collaborating in" meet the purpose just as well? There are hotheads in every profession and recent experiences emphasize that the medical profession is no less devoid of hasty, tactless and egocentric individuals than are other professions.

Members of the auxiliary medical professions, who have striven for years to establish their professions, and who are anxious to preserve the status which they have gained and the goodwill attached to that status are not usually hot-headed individualists, time servers or power seekers but are sober individuals with the welfare of their colleagues at heart and jealous of the integrity of their chosen profession. They do not need to be supervised. They may, and frequently do, seek to be advised. They often, as a result of long years of service to their profession, have a better grasp of its difficulties than do those who seek to supervise them and above all they are usually able to put service above internal politics.

Why then, when the Privy Council in England, and the South African Medical and Dental Council in South Africa are the final arbiters of

suitability for registration, is it necessary to waste time on argument over supervision when a spirit of helpful co-operation would solve all these difficulties?

The situation may perhaps be summed up by quoting from a letter to the *Times* by the Chairman, Board of Directors of Physiotherapy, Province of Ontario, Canada, published on December 7th, 1959. "During the past 20 years legislation governing many of the auxiliary professions has been introduced in most of the provinces. . . . In some the Acts include other professions, usually with separate Boards under the Act, but only one Act provides for any medical men—in a minority in this case—on the board or council set up under the legislation. All the other boards or councils are composed entirely of members of the profession concerned and are directly responsible to the Minister for standards of training." The letter continues: "The medical profession is intimately connected through universities and hospitals with the training and standards of the auxiliary professions. Moreover, in our experience, if a question of standards arises, it has been the practising physiotherapists who have argued for higher and therefore safer standards, not, with some notable exceptions, the medical profession. It would appear that the medical profession can and does rely upon the auxiliary professions to maintain the highest possible standards. They also know that advice and suggestions from them are always welcomed."

In South Africa the goodwill which exists between the South African Medical and Dental Council, medical technologists through the Society of Medical Laboratory Technologists of South Africa, and the medical profession represented by Pathologists and Heads of Laboratories has always been notable in the past. It is hoped that it will continue to be so in the future as control of education and training on a national basis is established.

ESSAY COMPETITION

The Director of the Amoebiasis Research Unit, C.S.I.R./University of Natal/Natal Provincial Administration announces that a competition will be held during 1960 similar to that recently conducted by this Journal. Conditions of entry are as follows:—

Entrants must be members of the Society of Medical Laboratory Technologists of South Africa in any grade of membership.

Closing date: September 30th, 1960.

Subject: THE TAPEWORM IN AFRICA.

All entries will become the property of the South African Journal of Medical Laboratory Technology for the sole use of that Journal.

The decision of the judges appointed by the Director of the Amoebiasis Research Unit will be final and no correspondence will be entered into regarding such decision.

The prize-winning entry will be published in this Journal at such time as the Editor may decide.

ABSTRACTS

A Training Programme for Medical Laboratory Assistants.
Rausch, V., Horde, R. & Ohlen, M. *Am. Journ. Med. Tech.*, **25**, 5, 387.

This report is a brief summary of events leading to the establishment of a training programme for "sub-professional medical laboratory personnel called Medical Laboratory Assistants". In view of the current trend towards the employment of the laboratory aide type of worker it makes interesting reading. It poses the questions, "What is the effect of this programme on recruitment for programmes in medical technology?" and "What is the effect on salaries of the M.T. (A.S.C.P.) personnel?"—and answers these lucidly with full supporting data. The report seeks to define duties of such personnel and emphasizes that no technologist has been replaced by a Medical Laboratory Assistant.

Curricula and syllabuses are presented. It is difficult to evaluate the long-term effect of such a programme but this account of an attempt to relieve certain labour shortages should be read by all who are concerned with staffing programmes.

Detection of Typhoid Carriers by Agglutination Tests.
Schubert, J. H., Edwards, P. R., and Ramsay, C. H. *J. Bact.*, **77**, 5 648-654

Two groups of normal individuals and chronic typhoid carriers were investigated for O and H agglutinins and for Vi agglutinins by bacterial agglutination against the Vi 1 strain. Also Vi haemagglutination tests were done using a heated Ballerup Vi extract. The results presented show the superiority of the haemagglutination test over the other methods used and confirm that tests for O and H agglutinins are of no value in the detection of carriers. The authors emphasize that "no serological test nor combination of tests yet devised can be relied upon to detect all carriers of S. typhi."

G.W.W.

BOOK REVIEW

Industrial Health Technology. Harvey & Murray. Butterworth & Co. (Africa) Ltd., 33-35 Beach Grove, Durban. Price 51s. 9d. plus 2s. 0d. postage.

Here is a book which breaks new ground and which will fill a long-standing gap in medical libraries. The problems of industrial health grow daily more complex and this work sets out to provide a clear statement of the known situation and at the same time to produce practical methods for use in overcoming the problems.

This is a field which does not concern the average medical technologist but many of our fellow workers have left the medical laboratory for associated industrial laboratories and here they will find much to interest them.

The book is in three parts:—

1. The Causes of Industrial Disease.
2. The Prevention of Industrial Disease.
3. The Comfort of the Worker.

Each section is presented in an interesting an readable form, and the third section on ventilation, lighting and noise, particularly suppression of noise, is well worth reading by all who are employers of labour.

The work is rounded off by a 'Glossary of Commonly Used Chemical Substances' each being given its chemcial formula, physical state, main uses, mode of entry into the human body and its chief effects.

A most interesting and useful book in the field of Industrial Medicine.

G.W.W.

EXAMINATION RESULTS

The following are the lists of successful candidates in the Examinations conducted by the Natal Technical College in November, 1959. *denotes pass with distinction.

Intermediate Examination (21 candidates).

*Blunt, H. J., Miss
*Calenborne, N.
Carter, J. W.
Cochrane, B. A., Miss.
De Witt, M. E., Miss.
Hawes, J. E., Miss.
Karpul, S. C., Miss.
Krige, R. D., Miss.
Laroye, L. M. A., Miss.
Lowrie, A. R.
*Oosthuizen, L. D. M., Miss.
*Peregrine, S. M., Miss.
Watt, J., Miss.

Haematology (20 candidates).

Bessin, C. R., Mrs.
Boisson, J. C., Miss
Charlesworth, L. J., Miss
*Dick, M. N., Miss
*Dukes, H. H., Miss
*Edrop, P. M., Miss
*Herd, M. E., Miss
Hodgson, D. M., Miss
Horsley, J. P., Miss
Jacobs, L. J. E., Miss
Liljestrand, S. K., Miss
O'Connell, P. A., Miss
*Oeschger, A., Miss
Phillips, A. V.
*Povall, E. A., Miss
Smith, S. A. S., Miss
Te Riele, H. T. M., Miss
*Towler, T., Miss
Webb, E. J., Miss

Bacteriology and Serology (19 candidates)

Boisson, J. C., Miss
Chalmers, J. M. C., Miss
Dick, M. N., Miss
*Dukes, H. H., Miss
Herd, M. H., Miss
Jacobs, L. J. E., Miss
Liljestrand, S. K., Miss
O'Connell, P. A., Miss
Owen-Davies, M., Miss
Povall, E. A., Miss
Te Riele, H. T. M., Miss

At a social function arranged by the Natal Branch prizes were awarded to the most successful student in each group.

Intermediate, donated by the Branch Chairman, Mr. G. W. Wikeley.
Miss. S. M. Peregrine.

Haematology, donated by the Natal Blood Transfusion Service.
Miss P. M. Edrop.

Bacteriology/Serology, donated by the Examiner, Dr. K. C. Watson.
Miss H. H. Dukes.

NOTICE TO CONTRIBUTORS

All contributions are to be addressed to:—The Editor, The South African Journal of Medical Laboratory Technology, Room 213, Dept. of Pathology, Medical School, Umbilo Road, Durban.

Contributions may be written in English or Afrikaans, and should preferably be typed in double-spacing on foolscap sheets on one side of the paper only.

Figures should be drawn in Indian ink, and all figures and tables should be labelled as such (e.g Figure 1, Table 1, etc.).

Authors should make adequate references to previous works on their subjects. These should be set out as follows:—Author's surname and initials of Christian names; the year of publication (in parentheses); the name of the journal, which should be abbreviated according to the World List of Scientific Periodicals (see below); the volume number (underlined); and the first page reference.

Example:—Moron, I. B. (1960). *J. unsuccess. Med.*, **20**, 99. References to books should give the author's name and initials, the year of publication, title of book, name of publisher, and town in which published.

References should be arranged in alphabetical order of the authors' surnames. If more than one work by the same author is listed, these should appear in chronological order.

Technologists are reminded that regulations demand that all original articles of a technical or scientific nature must be approved by the heads of their departments before being submitted for publication.

Title abbreviations according to World List of Scientific periodicals

All nouns commence with capital letters, and adjectives small letters. Articles, conjunctions and prepositions are omitted.

Examples:—

J. Amer. med. Ass.	*S. Afr. J. clin. Sci.*
Lancet	*Stain Tech.*
Amer. J. clin. Path.	*J. Bact.*

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Figure moet in Indiese ink geteken word en al figure en tabelle moet geëtikeer word as sulks (b.v. Figuur 1, Tabel 1, ens.).

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Titel verkortings volgens Wêreld Lys van Wetenskaplike Tydskrifte

Alle selfstandige naamwoorde moet begin met hoofletters en byvoeglike naamwoorde met klein letters. Artikels, verbindings, en voorsetsels word uitgelaat.

Voorbeelde:—

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Lancet	*Stain Tech.*
Amer. J. clin. Path.	*J. Bact.*

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